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(54) **METHOD OF MAKING CROSSLINKED POLYMER MATRICES IN TISSUE TREATMENT APPLICATIONS**

(75) Inventors: **Woonza M. Rhee**, Palo Alto; **Frank A. DeLustro**, Belmont; **Richard A. Berg**, Los Altos, all of CA (US)

(73) Assignee: **Cohesion Technologies, Inc.**, Palo Alto, CA (US)

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Primary Examiner—Nathan M. Nutter
(74) *Attorney, Agent, or Firm*—Laurie A. Axford; Dianne E. Reed

(57) **ABSTRACT**

Crosslinked polymer compositions comprise a first synthetic polymer containing multiple nucleophilic groups covalently bound to a second synthetic polymer containing multiple electrophilic groups. The first synthetic polymer is preferably a synthetic polypeptide or a polyethylene glycol that has been modified to contain multiple nucleophilic groups, such as primary amino (—NH_2) or thiol (—SH) groups. The second synthetic polymer may be a hydrophilic or hydrophobic synthetic polymer which contains, or has been derivatized to contain, two or more electrophilic groups, such as succinimidyl groups. The compositions may further comprise other components, such as naturally occurring polysaccharides or proteins (such as glycosaminoglycans or collagen) and/or biologically active agents. Also disclosed are methods for using the crosslinked polymer compositions to effect adhesion between a first surface and a second surface; to effect tissue augmentation; to prevent the formation of surgical adhesions; and to coat a surface of a synthetic implant.

12 Claims, 18 Drawing Sheets